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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/391,399 09/08/99 YAMAGATA

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EXAMINER

MMC2/0627

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ART UNIT

PAPER NUMBER

2862

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06/27/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/391,399

Applicant(s)
Hitoshi Yamagata

Examiner
Tiffany A. Fetzner

Art Unit
2862



-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on May 10, 2001
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on May 10, 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 10 20) ☐ Other:

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DETAILED Non-Final ACTION

1. The May 10th 2001 amendment is considered free of new matter by the examiner.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Response to Arguments

- 3.
4. Applicant's arguments filed May 10th 2001 have been fully considered but they are not persuasive, because new grounds of rejection that meets applicant's amended claims 1-7 and newly added claims 8-12 added with the May 10th 2001 amendment, is applied in this non-final action.

Drawings

5. The red-ink drawing corrections submitted May 10th 2001 have been approved by the examiner, and resolve the objections **A through J** from the February 13th 2001 office action. The drawing objection to table top being identified by two different reference numbers has been overcome by the May 10th 2001 amendment.

Claim Rejections - 35 USC § 103

- 6.
7. The rejections of **claims 1, 3-5** under **35 U.S.C. 103(a)** as being unpatentable over **Kaufman** US patent 4,829,252 issued May 9th 1989; in view of **Takekoshi et al.**, US patent 6,049,208 issued April 11th 2000 filed November 17th 1995; from the February 13th 2001 Office Action are **rescinded**.

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8. The rejections of **Claims 2, 6, and 7** are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Kaufman** US patent 4,829,252 issued May 9th 1989; in view of **Takekoshi et al.**, US patent 6,049,208 issued April 11th 2000 filed November 17th 1995; in further view of **Kan et al.**, US patent 6,094,590 issued July 25th 2000 filed September 18th 1997, from the February 13th 2001 Office Action are **rescinded**.

9. The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

12. **Claims 1-12** are rejected under **35 U.S.C. 102(e)** and **35 U.S.C. 102(a)** as anticipated by **Wilk** US patent 5,899, 857 issued May 4th 1999 filed January 7th 1997; or, in the alternative, under **35 U.S.C. 103(a)** as obvious over **Wilk** US patent 5,899, 857 issued May 4th 1999 in view of **Acker et al.**, US patent 6,128,522 issued October 3rd 2000 and filed May 22nd 1998.

13. With respect to (Amended) **Claim 1**, **Wilk** teaches “a patient couch, (i.e. component 12 in Figure 1) which enables movement of the patient” [See Figure 1 and shifting mechanism 38]; **Wilk** teaches “a position information establishing apparatus which provides 3-dimensional position information of the region of interest of the patient” [See abstract, col. 2 lines 1-33]; **Wilk** also teaches and a patient couch controller (i.e. the computer as taught in col. 3 lines 17-22, or support positioning module 66 as taught in col. 7 lines 10-13, with control module 58 and shifting mechanism 38) for moving the patient couch, based on the provided position information” [See col. 3 lines 46-50, col. 3 lines 56-58, col. 4 lines 1-15, col. 7 lines 10-13, col. 7 lines 18-21] “so that the region of interest is re-positioned in 3-dimensions (i.e. [See col. 3 lines 16-22, col. 7 lines 10-13]), substantially either at the center of the static magnetic field (i.e. interpreted broadly as the “focal point of the transmission components” because Scanner 30 is an NMR type imaging apparatus, [See col. 4 lines 60-65 and figure 1] and the center of the static magnetic field, (i.e. the isocenter of the magnet) is a focal point of magnetic uniformity in an NMR / MRI apparatus), or at the center of the gradient magnetic field.”

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14. **Wilk** teaches that the computer 28 may be connected to a NMR type imaging apparatus 30, possibly supplemented with ultrasonic imaging, juxtaposed to patient support 12. [See col. 4 lines 60-65] This teaching is important because it directly suggests using the invention with an NMR or MRI apparatus, and conventionally NMR / MRI apparatuses inherently include: “a static magnetic field generator for generating a static field; a gradient magnetic field generator for generating a gradient magnetic field that is superimposed on the static magnetic field; a radio-frequency magnetic field pulse transmitting/receiving unit, which applies a radio frequency pulse to a region of interest of a patient that is located within the static magnetic field, and which also receives a magnetic resonance signal that is generated from the patient;” Each of these features is considered inherent to the **Wilk** reference because an NMR / MRI scanning apparatus must inherently possess these features.

15. Additionally, **Acker et al.**, specifically teaches “A magnetic resonance imaging apparatus comprising: a static magnetic field generator (i.e. static field magnet 12 [See Figure 1 col. 8 lines 34-35]) for generating a static field; a gradient magnetic field generator (i.e. gradient coil assembly 14 [See Figure 1 col. 8 line 35]) for generating a gradient magnetic field that is superimposed on the static magnetic field; a radio-frequency magnetic field pulse transmitting/receiving unit, (i.e. RF transceiver 39 [See Figure 1 col. 9 lines 20-235]) which applies a radio frequency pulse to a region of interest of a patient that is located within the static magnetic field, and which also receives a magnetic resonance signal that is generated from the patient”. [See col. 9 lines 10 to 29 and col. 21 lines 49-54, where radio frequency energy is utilized and received.

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16. It would have been obvious to one of ordinary skill in the art, at the time that the invention was made that the **Acker et al.**, reference can be combined with the **Wilk** reference because **Acker et al.**, specifically discloses an MRI / NMR type imaging apparatus that is supplemented with ultrasonic imaging (i.e. high-intensity focused ultrasound HIFU), juxtaposed (i.e. superimposed on) to the patient on bed 24, with positioning system 23; which verifies the teaching of the **Wilk** reference [See col. 4 lines 60-65]. In **Acker et al.**, also three-dimensional data is obtained and utilized. [See col. 16 lines 19-58 specifically lines 19-21.] Therefore, the motivation for combining the positioning technique of the **Wilk** reference, with a magnetic resonance positional apparatus like **Acker et al.**, is directly taught and suggested by the **Wilk** reference itself.

17. With respect to (Amended) **Claim 2**, **Wilk** teaches “the position information establishing apparatus accepts input position information based on an image of the patient that is obtained from the magnetic resonance signal.” [See col. 4 line 60 through col. 5 lines 1-9] **Acker et al.**, also teaches this limitation. [See col. 16 lines 19-58 as one example.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 2**.

18. With respect to (Amended) **Claim 3**, **Wilk** teaches “the position information establishing apparatus comprises a position detection apparatus that detects the position of the region of interest.” [See **Wilk** col. Line 67 through col. 4 line 15, col. 7 lines 18-21, col. 7 lines 38-39] **Acker et al.**, also teaches this limitation. [See col. 16 lines 19-58, col. 18 lines 59-65, col. 21 line 67 through col. 22 line 5, col. 22 lines 15-50] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 3**.

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19. With respect to (Amended) **Claim 4**, **Wilk** teaches “the patient couch controller” (i.e. component 58) “performs an initial approximate positioning of the patient couch, based on a signal from the position detection apparatus.” [See col. 5 lines 23-33, col. 3 lines 17-22, col. 3 lines 46-51, col. 3 lines 60-65, col. 3 lines 67 through col. 4 line 16 In Figure 1 See shifting mechanism 38, MR scanner 38, computer 28, Focal point relocation control 34; In Figure 2 support positioning module 66] **Acker et al.**, also teaches this limitation.[See col. 16 lines 19-58 as one example; where the patient controller can be an automatic control computer 29, or an actual technician the “operator”]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1**, and **3** also apply to **claim 4**.

20. With respect to (Amended) **Claim 5**, **Wilk** suggests “the patient couch (i.e. component 12) is capable of moving the patient in the horizontal and vertical directions.” [See col. 6 lines 8-29, col. 6 line 66 through col. 7 line 1, and col. 7 lines 10-13; col. 1 lines 39-44, where three-dimensional data is continuously updated and tracked by tracking module 50 and then in response to tracking module 50, control module 58 positions the support 12 to display the target region. This directly implies that the support 12 is capable of horizontal and vertical motion because “three-dimensional” position data is tracked, and the target area stays centered, therefore the support 12 is capable of horizontal and vertical because the magnets and other components are fixed and do not move, (i.e. it is support 12 that moves). Therefore, movement up, down, forward, backward, right, and left is suggested.] Additionally, although the bed of **Acker et al.**, is fixed, the chassis 15 of **Acker et al.**, is capable of horizontal and vertical motion. [See col. 16 lines 19 through col.17 line 17 as one example.] Therefore, it would have been obvious to one of

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ordinary skill in the art, at the time that the invention was made that a readily obvious variation of the **Acker et al.**, apparatus is to have a patient table move the patient (up, down, left, or right) after the mobile apparatus is fixed, for situations in which precision adjustments (i.e. computer adjustments) are needed, and movement by the castors 29 would mis-align to many **components**. **Wilk** suggests and teaches moving the patient support 12 while keeping the MR scanner components fixed, and **Acker et al.**, suggests the reverse, so applicant's apparatus is an obvious combination of the two references. The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 5**.

21. With respect to (Amended) **Claim 6**, **Wilk** teaches, suggests and shows "A method for performing magnetic resonance imaging diagnosis, said method comprising: placing the patient onto a patient couch that is disposed within a static magnetic field and a gradient magnetic field"; [See Figure 1] "moving the patient couch based on a signal from a position detector so that a region of interest of the patient approximately coincides with the center of the static magnetic field or the center of the gradient magnetic field;" [See col. 3 lines 17-22] The examiner broadly considers the focal point of the radiation transmission and guidance components to represent the center of applied gradient magnetic fields, and / or the isocenter of the static magnetic field.

22. **Wilk** teaches, "applying a radio-frequency pulse (i.e. any type of electromagnetic energy) to the region of interest of the patient, and receiving a signal (i.e. broadly considered a magnetic resonance signal) that is generated from the patient; reconstructing a plurality of images of the patient, (i.e. the images of **Wilk** are continually updated) based on the signal received. (i.e. broadly considered a magnetic resonance signal)" [See col. 3 line 46 through col. 4 line 15 and

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col. 4 lines 60-65 where connection to NMR type apparatus 30 suggests applying and receiving RF frequency and MR signal data.] **Wilk** teaches, “selecting an image (i.e. continually updating the three-dimensional image that is displayed on the monitor) that includes the region of interest (i.e. the target image) from the plurality of images of the patient [See col. 2 lines 1-33, col. 4 line 66 through col. 5 line 9, abstract]; and moving the patient couch, based on the selected image [See col. 4 lines 1-15, col. 3 lines 17-22, col. 6 lines 8-13, col. 7 lines 10-21], so that the region of interest of the patient substantially coincides in 3-dimensions with the center of the static magnetic field or the center of the gradient magnetic field.” [See col. 3 lines 17-22]

23. Additionally, **Acker et al.**, also teaches “A method for performing magnetic resonance imaging diagnosis, said method comprising: placing the patient onto a patient bed that is disposed within a static magnetic field and a gradient magnetic field”; [See Figure 1] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 6**.

24. With respect to (Amended) **Claim 7**, **Wilk** teaches, “designating the region of interest within the selected image.” [See col. 3 lines 48-50, col. 4 line 60 through col. 5 line 9, col. 5 lines 22-33] The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 6** also apply to **claim 7**.

25. With respect to (New) **Claim 8**, **Wilk** teaches, “A method for performing magnetic resonance imaging diagnosis, said method comprising: placing the patient onto a patient couch [See Figure 1] that is disposed within a static magnetic field and a gradient magnetic field (i.e. the presence of a static and gradient magnetic field is an inherent part of NMR apparatus 30 taught by **Wilk** [See the rejection of **claim 1**] **Wilk** also teaches, designating a 3-dimensional position of a

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region of interest of the patient; [See col. 3 lines 48-50 col. 4 line 60 through col. 5 line 9, col. 5 lines 22-33], and moving the patient couch, so that the region of interest of the patient substantially coincides 3-dimensionally with the center of the static magnetic field or the center of the gradient magnetic field.” [See col. 3 lines 17-22, col. 4 lines 1-15, col. 6 lines 8-13, col. 7 lines 10-21] The examiner broadly considers the focal point of the radiation transmission and guidance components to represent the center of applied gradient magnetic fields, and / or the isocenter of the static magnetic field and it is this point that **Wilk** teaches the target region coincides with. The same reasons for rejection, obviousness, and motivation to combine that apply to **claim 1** also apply to **claim 8**.

26. With respect to (New) **Claim 9**, **Wilk** teaches “moving the patient couch so that the region of interest of the patient approximately coincides with the center of the static magnetic field or the center of the gradient magnetic field;”. [See col. 3 lines 17-22] **Wilk** also teaches, “applying a radio-frequency pulse (i.e. any type of electromagnetic energy) to the region of interest of the patient, and receiving a signal (i.e. broadly considered a magnetic resonance signal) that is generated from the patient; and **Wilk** teaches reconstructing a plurality of images of the patient, (i.e. the images of **Wilk** are continually updated) based on the signal received, (i.e. broadly considered a magnetic resonance signal).” [See col. 3 line 46 through col. 4 line 15 and col. 4 lines 60-65 where connection to NMR type apparatus 30 suggests applying and receiving RF frequency and MR signal data.] Additionally, **Wilk** teaches, “selecting an image (i.e. continually updating and therefore continually selecting, the three-dimensional image that is displayed on the monitor) that includes the region of interest (i.e. the target image) from the

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plurality of images of the patient, [See col. 2 lines 1-33, col. 4 line 66 through col. 5 line 9, abstract] and designating (i.e. choosing) the region of interest (i.e. the target region) within the selected image.” [See col. 5 lines 22-33, col. 6 col. 6 lines 31-39, col. 3 lines 45-65, col. 3 line 67 through col. 4 line 15 col. 2 lines 1-38.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 8** also apply to **claim 9**.

27. With respect to (New) **Claim 10**, **Wilk** teaches “obtaining positional information from a position sensor (i.e. detector 70) representing a 3 dimensional position for the region of interest.” [See col. 7 lines 10-21] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 8, 9** also apply to **claim 10**.

28. With respect to (New) **Claim 11**, **Wilk** teaches “A method for three-dimensionally positioning a patient region of interest substantially at an optimum MR imaging position (i.e. the focal point, or magnetic isocenter of the apparatus) within an MRI system” [See col. 4 lines 60-65 which suggest an NMR scanner 30 and therefore direct use in an MR system]. **Acker et al.**, also teaches this limitation

29. **Wilk** teaches said method comprising: positioning a patient region of interest at a first position within an MRI field of view; [See Figure 1, with component 30 interpreted as an NMR Scanner.] “generating images (i.e. interpreted as MR images) of the patient in three dimensions while located at said first position;” [See abstract, col. 2 lines 1-14] “locating and designating the patient region of interest position within said images” [See col. 3 lines 46-49, col. 5 lines 22-33, col. 6 lines 30-39]. **Acker et al.**, also teaches these limitations [See Figure 1, col. 16 lines 19-21, col. 16 line 22 through col. 17 line 17]

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30. **Wilk** also teaches “generating 3-dimensional position difference data between the designated position of the patient region of interest in the images and an optimum MR imaging position; and re-positioning the patient region of interest in 3-dimensions from said first, now designated, position to an optimum MR imaging position using said position difference data.”

[See col. 3 lines 45 through col. 4 line 15, col. 3 lines 17-22 which teach the optimal position of having the target region coincide with the focal point, or magnetic isocenter, col. 2 lines 1-45 and the abstract.] **Acker et al.**, also teaches this limitation [See col. 17 lines 28-53, col. 18 lines 59-64, col. 20 lines 12-37, col. 21 lines 49-54, col. 21 line 67 through col. 22 line 50, and col. 16 line 19 through col. 17 line 17; Center point 22 of imaging volume 20 is illustrated in Figure 3.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 8**, also apply to **claim 11**.

31. With respect to (New) **Claim 12**, **Wilk** teaches “position data provided by a position sensor that automatically senses a relative spatial position between a movable patient and a fixed MRI system.” [See col. 7 lines 10-21, col. 7 lines 38-39, and detector components 70.] The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 6, 8, 11**, also apply to **claim 12**.

32. Prior Art made of Record

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) US patent 6,112,110 issued to **Wilk**, August 29th 2000 and filed February 12th 1999. The examiner notes that **Wilk** 6,112,110 is a divisional to the **Wilk** 5,899,857 applied in this office

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action and that the disclosure is substantially identical although the claims are different. Therefore, under **35 USC 102 (e)** the **Wilk** 6,112,110 is applicable to all the claims, because it teaches the same features.

- B)** US patent 4,968,937 issued to **Akgun** November 6th 1990.
- C)** US patent 5,735,278 issued to **Hoult et al.**, April 7th 1998 and filed March 15th 1996.


Conclusion

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is (703) 305-0430. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on (703) 305-4705. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3432.

36. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0956.


TAF


JAY PATIDAR
PRIMARY EXAMINER

June 20, 2001